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SCIENCE SERVICE DEPARTMENT

February 19, 1949

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Pilot Bed

See Page 114

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AERONAUTICS

Prone Position Pilot Bed

This device is expected to lessen the hazards of pilots blacking-out, decrease flying fatigue and gravitational pull. It is in the testing stage now.

See Front Cover

➤ A BED for a pilot to permit flying speedy planes in a prone position was revealed at the Wright-Patterson Air Force Base, Dayton, O. It is a development of the aero-medical laboratory at the base.

Dubbed a prone-position pilot bed, it is designed to lessen flying fatigue from long hours in the air, and gravitational pull, both well-known hazards in maneuvering jet-fighters where pilot black-out is apt to occur.

Pilots who took part in recent tests of the bed, as shown on the cover of this week's SCIENCE NEWS LETTER, experienced no discomfort from lying stomach-down on the couch for as long as eight hours continuously, and noted no unpleasant after-effects.

To date the prone position bed has not been made a standard part of any plane, but has been installed in the nose of a B-17 for test purposes. It is to be tested

soon in the forward part of an F-80 jet-fighter. Both planes permit the use of conventionally seated pilots to take over in emergencies.

In general the bed consists of a length of nylon netting supported over specially curved sides so as to conform as closely as possible with the body contour. Abdominal support can be adjusted to individual requirements, and pilots are able to make adjustments as the need arises during flight. The pilot's head is supported by an adjustable jaw rest.

Special airplane controls have been designed for the prone position. Two movable pans with adjustable handgrips act as levers for steering the plane. The pilot's feet are braced against pedals which can serve either as rudder and brake controls in a conventional control system, or as brake pedals only in a system of the aileron-elevator-rudder type.

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NUCLEAR PHYSICS

British Lead in Bevatron

➤ ENGLAND is leading in the world race to produce the most powerful type of atom smasher, the bevatron, an Ohio State University physicist said.

Surveying the atom smashers now operating or under construction, Dr. M. L. Pool pointed out that no bevatrons have yet been put in operation.

"However, the University of Birmingham, England, is leading the world by having such a machine about half finished," Dr. Pool reported in the University's ENGINEERING EXPERIMENT STATION NEWS (Dec. 1948).

Bevatrons will have energy ranges measured in billions of electron volts compared with hundreds of millions of electron volts for the most powerful types of cyclotrons, most potent and best known type of atom smasher now operating. The English bevatron will generate approximately 1,300,000,000 electron volts when completed.

Two bevatrons, both more powerful, are in the early stages of construction in this country. One, at the University of California in Berkeley, will be the world's most powerful atom smasher with a top voltage of 6,000,000,000. Another bevatron being constructed at the Brookhaven National Laboratory on Long Island, N. Y., will generate 3,000,000,000 volts.

Most important advance expected from

the bevatrons will be increased laboratory production of the powerful mesons, particles found in the cosmic rays which bombard the earth from outer space. First man-made mesons have been produced by University of California scientists using the largest cyclotron now in operation.

When the University of Birmingham's new bevatron is completed, Dr. Pool predicted, "mesons of all kinds can surely then be made abundantly."

The bevatron, a sort of giant cyclotron, is also known as the "cosmotron" or "proton synchrotron."

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NUTRITION

No Need To Count Vitamins With Your Cocktails

➤ IF YOU have been swallowing vitamin B pills or yeast with every cocktail in order to have a clear head the morning after the party, you can relax. So long as your diet is adequate, you need not worry about counting vitamins at cocktail parties.

This reassurance about vitamins and alcohol comes from Dr. Norman S. Moore of Cornell University School of Nutrition.

The idea that extra vitamin B is needed when alcohol is consumed is wrong and was based on a misunderstanding of scientific findings, Dr. Moore points out in his report to the NEW YORK STATE JOURNAL OF MEDICINE (Jan. 15).

The mistake in thinking started in 1928 when it was first suggested that vitamin lack might be a factor in the development of the severe nerve disorder, polyneuritis, in alcohol addicts. Then it was found that alcoholics with this nerve disorder improved while taking whiskey if they also ate a vitamin-rich diet and took extra vitamins.

About this time, too, doctors were calculating vitamin B₁ requirements on the basis of total calories consumed per day. If alcohol was taken, they added in the alcohol calories and this meant increasing the amount of the vitamin. And it was assumed that vitamin B₁ was needed for the chemical conversion, in the body, of alcohol to fuel, because the vitamin is needed for the conversion of sugar and starches to fuel.

Recent studies, Dr. Moore points out, show this assumption is not correct. The chemical breakdown of alcohol skips a step that is taken in the chemical breakdown of the sugars and starches. It is this step which in the case of the sugars and starches needs vitamin B₁.

Chronic heavy drinkers are likely to be short on this vitamin because they don't eat well, not because the extra alcohol requires more of the vitamin. The occasional or social drinker who consistently follows a good diet will not need extra vitamin B₁ for his cocktails.

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ENGINEERING

String Fluorescent Lights Along Bridge Fence

➤ A NEW TYPE of highway lighting is under test in Salem, Mass., on a bridge between this city and Beverly, in which fluorescent lamps in a continuous string are mounted five feet above the roadway on a fence rail along one side of the bridge.

The test is being conducted by engineers of Sylvania Electric Products, Inc., and preliminary results indicate that excellent visibility is obtained. The system using the low-mounted continuous fluorescent lamps seems to overcome blinking effects on drivers experienced by low-mounted incandescent lamps, and to eliminate uncomfortable glare from the light source itself.

Reflectors placed behind the lamps throw the light across the 32-foot road to illuminate the sidewalk and curb. The light is bright enough to permit driving without the use of the headlights on the car. The system is said to be promising, particularly for use on bridges. Among other advantages, it eliminates the need for lamp posts on a bridge.

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NUCLEAR PHYSICS

New Atomic Furnace Plant

Somewhere in the West a new atomic power field station will be constructed where new kinds of nuclear reactors will be built.

► AN ATOMIC furnace factory where machines for releasing atomic energy will be manufactured and tested is planned for construction somewhere in the West, Dr. Robert F. Bacher, scientist-commissioner of the U. S. Atomic Energy Commission, disclosed.

The Commission program for the development of machines for harnessing atomic energy, called nuclear reactors, was unveiled by Dr. Bacher to the American Academy of Arts and Sciences in Boston. It calls for operation, construction or investigation of nearly a dozen different kinds of atomic machines.

Three kinds of nuclear reactors were built during the war: chain-reacting piles at Chicago and Oak Ridge, Tenn.; and the big reactors at Hanford, Wash., for making the synthetic atom bomb element, plutonium. A high-energy atomic furnace has been put into operation at Los Alamos, N. Mex., since the war, and a more conventional chain-reacting pile is nearing completion at Brookhaven National Laboratory on Long Island.

Four new kinds of reactors will be built in the near future. They are:

1. Materials testing reactor for testing materials for use in atomic machines. This high-energy, small-space reactor has been under design for two years at Oak Ridge National Laboratory.

2. Naval reactor to be constructed by Westinghouse will be a land-based prototype for a shipboard atomic power plant. Plans are being developed at Argonne National Laboratory near Chicago, and construction will be started in about a year.

3. High-energy experimental breeder or fast reactor being designed at the Argonne Laboratory. It will operate with high energy atomic bullets, or neutrons, like the present Los Alamos pile, but will be more powerful and use uranium 235 instead of plutonium for fuel.

4. An "in-between" reactor operating with neutrons at intermediate energies, between the slow neutrons of the wartime piles and the high-energy pile at Los Alamos. The intermediate reactor will be built at Knolls Atomic Power Laboratory operated by General Electric at Schenectady, N. Y.

Both the materials testing reactor and the land-based Navy plant will be built at the new atomic power field station "in the western part of the United States," Dr. Bacher said.

He described the new station as a "field facility" of the Argonne Laboratory, major

center of the Commission's nuclear reactor work.

When it is selected, the new site will come under the secrecy regulations which govern the Hanford plant in Washington state, Dr. Bacher indicated. In addition to the two reactors scheduled for construction at the yet-to-be-picked location, others will probably be manufactured at this atomic furnace factory, he indicated.

In addition to the four new types of reactors now moving from the drawing board to construction stage, four other new kinds of atomic energy machines are under study.

ENGINEERING

New Solar-Heated House

► SUN-HEATED water is to be used in an experimental house just completed in Cambridge, Mass., to determine how effectively solar heating may be used to replace coal and oil in keeping the dwelling comfortable in the cold weather of a New England winter.

The building was erected by the Massachusetts Institute of Technology and is to be used in connection with solar heating investigations to determine to what degree the sun can compete with conventional methods of heating. The construction of

They are:

1. Still in the study stage, but getting lots of attention, is nuclear reactor for aircraft, being investigated in a project called NEPA (nuclear energy for propulsion of aircraft). A survey of this field by the Massachusetts Institute of Technology is now being studied by the Commission.

2. A power plant using natural uranium for fuel. The Hanford plutonium-making reactors use natural uranium, but harnessing this fuel for power production is a job for the future.

3. Homogeneous reactor in which the fuel and materials for cooling, moderating and reflecting would all be mixed together instead of having fuel embedded in the other materials.

4. A simple, low-cost reactor for scientific research and training of new technical people in atomic energy.

End products of this program of atomic machine research and construction may be economically useful electrical power from atomic energy, Commissioner Bacher concluded.

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SOLAR HOUSE—This is a view of the south exposure showing the areas of the heat collector on the roof of the house.

the house, is used for storing and distributing the heat.

Once warmed by the sun, the water is pumped into an insulated tank in which it is held for use during sunless hours. The tank has a capacity of 1,200 gallons of water which should, during an average January day, rise in temperature a few degrees more than it falls at night, thereby storing heat energy for sunless days.

The heat-storing equipment is designed to keep the house at 68 degrees Fahrenheit night and day. However, supplementary heating has been provided by means of electric heaters which will go into operation if the inside temperature drops to 65

degrees. One room of the building is used for recording instruments to keep a continuous record of the temperatures. The other rooms are to be used as a home for an institute student and his family.

The parts of the entire system include the roof collectors, an attic storage tank, a radiant ceiling heating unit, two circulating pumps, and controls. Whenever the sun heats the water in the roof collectors to a temperature above that in the storage tank, a pump circulates the water from storage tank to roof and back. At other times the flow is cut off. Warmed water for room heating is circulated by the second pump.

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ton of rock ("x" times nearly nine-tenths of one ounce of uranium for about each 2,205 pounds of rock). If "x" is two, the rock would have only about one and eight-tenths ounces of uranium in each metric ton.

This fairly simple method is suggested by the Hungarian scientists for use by uranium explorers who want to cover lots of ground in a short time.

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The principal food of *wild hawks* is destructive rodents, not chickens as many believe.

NUCLEAR PHYSICS

Tips To Uranium Hunters

➤ AMERICAN scientists and atomic prospectors hunting for the atom bomb element uranium got some tips from behind the Iron Curtain.

A relatively simple mathematical formula for telling how much uranium is concentrated in rock, using a Geiger-Mueller counter, was reported in *SCIENCE* (Feb. 11).

The authors are A. Szalay and Eve Csongor, Hungarian physicists at the University of Debrecen, Debrecen, Hungary. Their findings were made during a search for uranium in the Velence Mountains in Hungary. They do not discuss whether or not they found important new deposits of the radioactive element in their survey.

But they do believe they have discovered an important aid to uranium hunters, which they are passing on to Americans.

Geiger-Mueller counters, usually known only by the first name, are essentially tubes with a delicate electrical balance and amplifiers for giving off a sharp click when radiation strikes the tube and changes its electrical charge. The Hungarian sci-

tists point out that the counter is used in prospecting for uranium to reveal the presence of radioactive materials.

The problem they claim to have solved is determining from the number of clicks, with the aid of mathematical formulae, how much uranium is in the rock.

Here's the way the Hungarian physicists advise prospectors to find out in a hurry how much uranium is in rock:

Shield the Geiger counter tube—a any commercial tube size—with a thickness of two millimeters (about eight-hundredths of an inch) of lead. Place the counter against the rock. Cosmic rays from outer space will make the counter click, even with no radioactive material in the neighborhood, so the clicks of the counter minus the cosmic ray count will give "x" times the cosmic ray count. That is, if the cosmic ray count is 10 and you count 30 clicks, "x" is two (10 cosmic clicks and 20 uranium clicks).

The quantity of uranium in the rock is "x" times 25 grams of uranium per metric

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AGRICULTURE

North Africa Over-Peopled

French who seek to reclaim land with science face problems familiar elsewhere. Due to increased population, people are farming slopes, causing erosion.

► FRENCH agricultural administrators in North Africa are up against some tough problems, states Dr. Walter C. Lowdermilk, Berkeley, Calif., who spent some months in that region as consultant for the French colonial government, following his recent retirement from the U. S. Soil Conservation Service.

Fundamentally, the troubles of the French there have the same starting point as those of agricultural planners elsewhere in the world: too many people for the land to support, at least by present land-use methods. The native population has been increasing fairly rapidly since the French suppressed intertribal warfare. Lacking new land at lower altitudes, the people are farming higher and higher up the mountain slopes. The result, there as elsewhere, has been ruinous erosion, plus a good deal of choking of irrigation works with silt.

Grazing practices of the people, in Morocco particularly, have aggravated the situation. Sheep, goats and camels are the principal livestock animals, and all three are most destructive feeders. It is a byword among the French that "What the sheep leave the goats eat; what the goats leave the camels eat—and the camels don't leave anything." The result again is deadly erosion. And since the people are tradition-bound Moslems it is practically impossible to persuade them to anything new.

In Morocco, Dr. Lowdermilk stated, there is a good deal of potentially productive land at lower levels. It could be reclaimed for farming if irrigation water could be got onto it. There is a good water supply in the mountains. It might seem a simple matter to build dams and dig canals from the mountains to the lowlands.

However, there is an intermediate zone flanking the rock core of the mountains through which waters flow, where the native rock and its soil, an uplifted ancient sea bottom, still has a good deal of salt in it. River waters pick up some of this salt as it flows through. Evaporation in the lowlands might produce enough concentration of the salt to ruin the very soil being reclaimed. This problem is not beyond solving, Dr. Lowdermilk thinks; but solving it would require time—and the population pressure demands an immediate rather than a long-time answer.

In Algeria and Tunis, which have been longer under French occupation, there are more French settlers. The latter have been subjected to some criticism for crowding

the Arabs off their land; but this, Dr. Lowdermilk feels, is not well founded. Largest expansions in French-worked acreage, he states, have been made by draining swamps and bulldozing out big thickets of a scrub palm quite similar to the scrub palmetto of our own Southeast. The Arabs had neither the machinery nor the capital for these two types of reclamation, and the French had. So the French developed part of the new land, and demonstrate how the larger part of the land can be reclaimed for the native people, when they will accept modern agricultural methods.

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AERONAUTICS

Record Flight Conditions With New Airborne Device

► A NEW automatic instrument for installation in airplanes, which will make and keep a continuous record of flight conditions encountered, was revealed by General

Electric. Items recorded include air roughness, altitude, and the operation of the automatic pilot and of the de-icing equipment.

The actual record is made by a stylus which traces through a thin coating on a slowly moving strip of paper, leaving a black trace. These recorders will provide commercial airlines with increased information on their flight operations, and make possible greater operational control. A commercial installation will be made soon in a transport of Capital Airlines to determine its practical value in scheduled flying.

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ENGINEERING

Windchill To Be Studied In New Army Wind Tunnel

► HEAT LOSS from objects subjected to winds of various speeds is under study at the Army's Engineer Research Laboratories, Fort Belvoir, Va., and for the purpose a unique wind tunnel has been installed. Accurately controlled air speeds from one to 100 miles an hour can be obtained.

Designed for use in two already existing temperature test chambers, the new tunnel may be operated at atmospheric temperature ranging from 70 degrees below zero Fahrenheit to 150 degrees above. In addition, it can be used in humidity ranges



FLIGHT RECORDER—The device automatically records air roughness, altitude, and operation of automatic pilot and de-icing equipment on aircraft. It is being checked here in a B-29 Flying Laboratory at General Electric Flight Test Center near Schenectady, N. Y.

from 20% to 100%, and in simulated altitudes up to 25,000 feet.

Stated technically, the tunnel will be used to compile data on the acceleration of heat loss due to windchill. Of particular interest, is a study concerning the best shape of an object to minimize heat loss. This, from the military point of view, can be translated into savings of fuel in cold climates, such as northern Alaska.

The throat of the tunnel measures only one square foot, but this is large enough

for testing small objects mounted on its half-inch steel floor. A pictorial record of the air current can be made by mounting a camera in an aperture on one side of the throat, and a light source similarly on the other. Smoke introduced at the blower will result in a shadowgraph showing concentrations of smoke particles where the air currents are most dense. Heat transfer from the object will be recorded electrically.

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AGRICULTURE

World Agriculture Census

► SOME TIME after 1950, we are going to know more about rice in Siam and farming in the rest of the world than has ever been learned before. This will be the result of a comprehensive census of world agriculture slated for next year, under the auspices of the Food and Agriculture Organization of the United Nations.

More than 65 nations, most of them FAO members, have indicated that they will cooperate in the census.

Here in this country it will be nothing new. The facts on farming will be compiled along with all the rest of the census information on the U. S. in the regular 1950 census.

Conspicuous as usual by her absence is the U.S.S.R. which has not taken any interest in the project. But Poland, Hungary and Czechoslovakia, all FAO members now under Communist influence, are expected to cooperate in the greatest farm-fact-collecting undertaking ever planned.

Two previous world agriculture surveys have been made, but FAO hopes it can produce more accurate and complete figures. The earlier surveys were conducted under the leadership of the International Institute of Agriculture at Rome in 1930 and

1940. The latter census was of course abandoned by many countries because of World War II.

Compared with the comprehensive statistics compiled by the U. S. Department of Agriculture, the questions which will be asked farmers around the world seem pretty brief. But it will be the first time that many farmers in some lands have ever been quizzed on the extent of their operations.

Six groups of information will be sought. These will involve the size and kind of farm; how the land is used; how many people are on the farm; area harvested of various crops; use of animal or mechanical power; and livestock population.

In addition to this minimum question sheet, more detailed surveys are being planned which it is hoped can be used in many countries.

One of the biggest problems, which is being tackled now, is training personnel to conduct the survey, particularly in backward areas.

When the census is completed, FAO hopes it can give the world the best picture of the world food situation it has ever had.

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MEDICINE

Acid from Sweat Aids Skin

► PATIENTS with psoriasis and another stubborn itchy skin disease, neurodermatitis, may get help from pills containing a fatty acid found in sweat.

"Definite improvement in the psoriasis" in 17 patients and "improvement or disappearance of the lesions and itching" in eight patients with neurodermatitis following treatment with the new remedy are reported by Dr. Henry Harris Perlman of Philadelphia in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Feb. 12).

Calling the new medicine "an interesting approach to the control" of these two diseases, the editor of the A.M.A. Journal warns, however, that the method "is still in the stage of experimental investigation and must be so regarded until further evi-

dence is accumulated. Under no circumstances should it be accepted at this time as the most effective and only treatment."

Dr. Perlman himself points out that more time and study of a larger number of patients are needed to determine the true value of the remedy.

Its technical name is undecylenic acid. Made into a powder and an ointment, it was found by Navy medical officers to be good for preventing and treating athlete's foot. Dr. Perlman was led to its use by reports from other scientists of its killing action on the fungus that causes ringworm of the scalp.

He had some of it made up in capsules to be swallowed and gave it to four children with ringworm of the scalp. It helped but

did not cure them. But it did cause a profuse peeling of the scalp, which led Dr. Perlman to think it might help in psoriasis.

The psoriasis patients had had their skin trouble for from two months to 27 years. The psoriasis spots began to disappear in three and four days after treatment in some cases, while others took two weeks or more. Relief of itching came in some cases in two days after starting the medicine, while in others the itching was at first worse and then gradually got better. In three patients there was complete disappearance of the psoriasis. In six patients there was 75% disappearance and in the others there was 50% disappearance.

Dr. Perlman thinks, though there has not been enough time to be sure of this, that the recurrence of the disease can be prevented by the treatment.

Patients took the capsules three times a day. The best size of dose has not yet been determined. Many patients complained of a bitter taste after the medicine. Belching was another unpleasant symptom. Some also had stomach distress and nausea. Putting the chemical into capsules which do not dissolve until they get into the intestines probably would eliminate the stomach distress and nausea but it is not yet available in this form. Carbonated waters, soft drinks or soda bicarbonate, Dr. Perlman found, relieve the stomach distress and nausea.

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MARINE BIOLOGY

"Hot Water Fish" Added To U. S. National Museum

► MORE than 5,000 fish and other sea animals from probably the hottest body of salt water in the world have been brought back to the U. S. National Museum in Washington from the Persian Gulf.

The Gulf is a shallow body of water connected to the Indian Ocean by a narrow channel. In midsummer, water temperatures reach over 100 degrees Fahrenheit. It has less sea life than cooler waters, and fish and animals found there have been able to adapt themselves to the warm water.

Strangest of the fishes collected by Donald S. Erdman of the staff of the Smithsonian Institution are "sea moths," "fool fishes" and highly poisonous jellyfish. The "sea moths" are little brown creatures with large fins, that live on the surface of the water. "Fool fish" are simply stupid, sluggish fish which make no effort to escape capture even when a bright light is shone on them. The poisonous jellyfish, dreaded by Arabian fishermen, are coffee-colored organisms with small bodies but dangerous tentacles from two to three feet long.

Mr. Erdman's survey was carried out under the sponsorship of the Arabian-American Oil Company.

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ZOOLOGY

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GENERAL SCIENCE

STS Honorable Mentions

Fifty-five girls and 205 boys will be recommended for scholarships as a result of their selection for honors in the Eighth Annual Science Talent Search.

► **HONORABLE MENTIONS** in the Eighth Annual Science Talent Search were announced by Watson Davis, director of Science Service. Girls number 55 of the 260 outstanding seniors in the list, and 205 are boys; the division was determined by the ratio of girls to boys who participated in the competition.

The 260 young people to whom Honorable Mention listing was given reside in 173 communities, located in 38 states and the District of Columbia. They were chosen from among 16,218 entrants, 2,482 of whom completed the science aptitude examination, submitted recommendations and scholarship records and wrote essays on "My Scientific Project."

Forty highest-ranking boys and girls have already been notified that they are winners of all-expense trips to Washington, where they will spend five days as participants in the Science Talent Institute, to be held here March 3 through March 7. At the closing session of the Institute, \$11,000 in Westinghouse Science Scholarships will be distributed. (See SNL, Feb. 5).

All 300 (40 winners; 260 honorable mentions) selected for honors will be recommended as candidates for matriculation to scholarship-awarding colleges and universities.

In the seven preceding Science Talent Searches, most of the students named in the Honorable Mentions list have been offered scholarships, and many of those named this year will qualify for valuable scholarships

and other financial aid in the colleges, universities and technical schools of their choice. The judges found all 300 winners to be students of outstanding ability.

Students in the Honorable Mentions list invariably rank high in their high school graduating classes: 35% of the boys and 40% of the girls stood first or second among their classmates. All the boys and girls have studied some science and/or mathematics for three years or more in high-school.

The Honorable Mentions did not win their places merely by keeping their noses in books; without exception they show records of participation in extracurricular activities. Science clubs have attracted many: 109 belong to such clubs, most of which are affiliated with the Science Clubs of America.

In Alabama one student received honorable mention; in Arizona, four; Arkansas, one; California, 15; Colorado, three; Connecticut, five; District of Columbia, two; Florida, three; Georgia, five; Illinois, 11; Indiana, eight; Iowa, four; Kansas, three; Maryland, two; Massachusetts, three; Michigan, five; Minnesota, three; Missouri, two; Montana, five; Nebraska, seven; New Hampshire, two; New Jersey, 18; New York, 79; North Carolina, one; North Dakota, one; Ohio, 11; Oklahoma, two; Oregon, one; Pennsylvania, 21; South Dakota, one; Tennessee, one; Texas, five; Utah, three; Vermont, one; Virginia, seven; Washington, five; West Virginia, three; Wisconsin, five; and Wyoming one.

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The Harvard zoologists were sure that they were listening to white whales because they could see them in the water through field glasses while as far as two miles away. The noise, from 60 to 90 feet under the surface of the water, would begin as the scientists saw the porpoises approach, grow louder as the noisy animals came near the hydrophone and fade as they passed out of sight.

White whales are porpoises that grow to lengths between 12 and 14 feet, with a limit of about 18 feet. They are also called beluga, a Russian word meaning white whale and, by scientists, *Delphinapterus leucas*.

In addition to their experiments in the Saguenay, the scientists tried listening to white whales in the St. Lawrence River. But strong currents, shoals, tide rips and traffic made listening for porpoises difficult.

The calls of these sea mammals, the zoologists suggested, are sufficiently characteristic that it may be possible to identify them at sea by listening for them. Future listening also may go beyond the range of the unaided human ear in supersonics, it was proposed.

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CROSS COUNTRY SPRINT—The power of the six jet engines of the U. S. Air Force Boeing B-47, that recently flew at 607 miles an hour from Washington State to Washington, D. C., is indicated by the "trailer" left behind in the take-off. This plane is about the size of the famous B-29, and can carry a bomb load of 10,000 pounds. A notable feature is its swept-back wings; also two of its engines carried near wing-tips.

ZOOLOGY

Whales Found Loquacious

► **WHALES** that whistle, squeal, chirp, mew, cluck and even trill were reported by two Harvard scientists.

William E. Schevill and Barbara Lawrence, both of the Harvard College Museum of Comparative Anatomy, explained that they had listened in on some white whales or porpoises in the lower Saguenay River in Quebec, Canada. They got in on the whales' party line by using a hydrophone, or underwater microphone, with an amplifier.

They described some of the whale noises as "ticking and clucking sounds slightly reminiscent of a string orchestra tuning up, as well as mewing and occasional chirps."

Other times, "the calls would suggest a crowd of children shouting in the distance."

On two occasions they heard the trilling of whistles which have been heard above the water. These have given the white whale the nickname, "sea canary."

All this bizarre collection of noises in what we would term quiet waters led the Harvard scientists to point out that these white whales are mammals, even as people. And they may be more like humans than anyone would have guessed.

"This loquaciousness contrasts markedly with most terrestrial (land) herd mammals and compares with such chatterboxes as monkeys and men," the whale listeners commented.

POPULATION

**Carmel-by-The-Sea, Calif.
Is Most Feminine U. S. City**

► **CONTRARY** to popular opinion, Washington is not the most feminine city in the United States.

In big cities, the sex ratio—the number of men in proportion to the number of women—is neither extremely high or extremely low. This is the finding of Dr. Joseph H. Greenberg, of the University of Colorado, who made a study of the size and sex ratio of all United States cities at the time of the 1940 census and who reports his results in the *AMERICAN SOCIOLOGICAL REVIEW*.

The most feminine city is Carmel-by-the-Sea, Calif. And it is the only city in which there are as few as seven men to each 10 women. It is just because it is a small city (less than 5,000 inhabitants) that it is so attractive to women, Dr. Greenberg believes. It would not be so specifically a resort town and artists' colony if it were larger.

It is also size that gives the most male city in the country its extremely high sex ratio. Dannemora, N. Y., has a sex ratio of 577.4 males to each 100 women—a proportion of nearly 58 men to each 10 women. It has this high sex ratio because the prison located there outbalances the population of the city.

Science News Letter, February 19, 1949

PUBLIC HEALTH

**Cancer Now Ranks Second
As Killer of Children**

► **CANCER**, including leukemia and Hodgkin's disease, is now the second ranking cause of death among children. At the five- to nine-year-age period it leads all other diseases as a killer, statisticians of the Metropolitan Life Insurance Company in New York report from a study of children insured in the company's industrial department.

Deaths from the four principal communicable diseases of childhood, scarlet fever, diphtheria, whooping cough and measles, are now so few they are becoming a rarity, the company's records show. The big measles year in 1948 brought deaths from this disease above the all-time low, but the 1948 figure of 0.5 per 100,000 for the industrial policyholders is considered "favorable."

In the general population of the United States, cancer, leukemia and Hodgkin's disease now kill well over 2,000 children each year. The death rate among the insured children was 7.1 per 100,000 in the period 1943-47, an increase of about 40% since 1930-34.

The increase was slightly greater for boys than girls, and the cancer death rate among boys is now nearly one third higher than among girls.

Leukemia is the most common type of fatal cancer in children.

"While the figures on cancer in childhood do not make cheerful reading, the situation looks worse than it really is," the statisticians state.

Actually a part of the recorded increase in the mortality, they explain, is "probably spurious," reflecting more accurate diagnosis. An increased proportion of children with cancer are getting medical attention earlier in the disease. An increasing number are surviving five and 10 years after treatment, the statisticians reassure.

They urge parents and teachers to give increasing attention to abnormal signs and symptoms which may mean cancer in children. Unusual mental or emotional behavior, they point out, may give the first clues to brain tumors in children.

Science News Letter, February 19, 1949

TRANSPORTATION

**Motorists Pay Most for
Roads but All Need Them**

► **IT COSTS** the average motorist about \$57.00 a year in automobile and gasoline taxes, the American Road Builders' Association was told in Washington by Prof. Ben H. Petty, of Purdue University, LaFayette, Ind. Daily, this is cost of a package of cigarettes.

This assessment is primarily for road building and maintenance, but the entire cost of roads should not necessarily be borne by motorists. Every community is dependent on highways and local streets. Few seem to realize, he said, that the food they eat, the clothing they wear, the fuel they burn, their house itself, all, at some time or other, either as raw material or in the processed state, were transported completely or partially over the highways.

The early attitude of opposition to providing money to build good roads is largely a thing of the past, he stated. The progress in developing highways has been bought with "good roads" campaigns, legislative battles, financial sacrifices, political fights and careful planning. In 1904, as automobiles began to appear on the streets, there were 144 miles of paved roads in the United States outside city limits. By 1948, approximately 50% of the roads were surfaced with one material or another.

While the money available annually for road improvement now is twice as much as was used two decades ago, material and labor costs have greatly increased, and methods which will result in economy are essential. These include careful selection and training of the personnel employed, care in selecting the right kind of equipment for the job, purchasing tested materials, and better organization, administration and supervision. Freedom from politics is essential.

Science News Letter, February 19, 1949

IN SCIENCE

COMMUNICATIONS

**New Light Teletypewriter
Usable Near Front Lines**

► **THE U. S. Army** has a new portable teletypewriter, weighing only 45 pounds, that is suitable for use in advanced military positions and promises a major advance in communications. Because of its lightness, it can be used much closer to front lines than the ordinary machine now widely used.

A teletypewriter is a combination telegraph instrument and a typewriter. Messages typed on the sending machine come out in typed form on the receiver. In fact, the messages can be received on many machines at the same time. Teletypewriters are found in most newspaper offices to receive news items from central distributing agencies.

This new portable teletypewriter, developed by the Army Signal Corps at Fort Monmouth, N. J., is about one-fourth the size and one-fifth the weight of older machines to do the same work. It has 300 fewer parts, but is capable of transmitting and receiving messages 66% faster than existing types. Also, it will operate on both wire and radio circuits.

There are three component parts to a complete field unit. They are the teletypewriter itself, a power unit, and a case of accessories. The three together weigh 116 pounds. All units are waterproof, both to permit flotation in amphibious activities, and to provide protection from weather. In the development of this apparatus, the Signal Corps was aided by a research and development contract with Kleinschmidt Laboratories, Inc., Highland Park, Ill.

Science News Letter, February 19, 1949

ENGINEERING

**Zirconium Hailed As New
Metal For Atomic Piles**

► **THE METAL** for building atomic energy piles of the future may be zirconium. This is forecast in the fifth semiannual report of the Atomic Energy Commission.

Engineers have not taken the metal seriously heretofore, on account of difficulty in handling it. But it is known to be among the few substances suitable for atomic pile building. So scientists are trying to get around the difficulties.

They have recently done this with titanium, and succeeded in extracting a corrosion-resistant metal of unusual strength. Zirconium would be expected to have similar qualities, since it is titanium's closest chemical relative.

Science News Letter, February 19, 1949

THE FIELDS

PUBLIC HEALTH

Record Low Death Rate Is Reported for 1948

► A NEW record low death rate, with even accident and chronic heart disease death rates dropping, is proudly announced by the Metropolitan Life Insurance Company in New York. The low death rates were recorded among the company's millions of industrial policyholders in the United States and Canada.

The death rate for the year was 6.5 per 1,000 policyholders, compared with 6.6 in 1947. The year 1948 was the fifth in succession to show improvement in mortality, exclusive of enemy action.

As a result of the improved mortality, the average length of life, or expectation of life at birth, among the company's policyholders was about one-third of a year longer than in 1947.

Sulfa drugs and penicillin can be thanked for the new low 1948 death rates for syphilis, diarrhea and enteritis (intestinal inflammation), appendicitis and diseases of the puerperal (childbirth) state.

Cancer was the only disease of middle and later life to show an increase in the death rate in 1948. This rose from 109.2 to 112.0 per 100,000 of the industrial policyholders.

The decline in the mortality from chronic nephritis (kidney disease), brain hemorrhage, and the chronic heart diseases more than offset the increase in the death rate from the diseases of the coronary (heart) arteries and angina pectoris.

Science News Letter, February 19, 1949

CHEMISTRY

Livestock Wood Molasses To Be Made from Wastes

► WOOD molasses, in a 20,000-gallon-per year volume, will soon be in production at Wilson Dam, Ala., under a project in which the U. S. Forest Products Laboratory of Madison, Wis., is cooperating with the Tennessee Valley Authority. The raw material will be wood wastes from forestry and sawmill operations, and cull trees removed to permit better forestry growths.

The Forest Products Laboratory already has a wood molasses pilot plant in operation in Wisconsin. This will be a second pilot plant, both producing a product primarily for cattle feed, to determine the best methods of extraction and the best methods of using the output for livestock feeding and other purposes.

There are plenty of young trees that should be removed in the Tennessee Valley,

and plenty of logging residues and unavoidable wastes of woodworking plants. Former wastes may become an important source of primary income to farmers and foresters with the establishment of mills to use them. The Wisconsin plant has already proved that livestock molasses can be produced economically. Northern and western state agricultural experiment stations have proven its value as feed.

Wood molasses, also called wood-sugar molasses, is produced by converting the wood's cellulose and hemicellulose to sugars by treatment with hot dilute acid in a digester, or hydrolyzer. This produces a weak solution of sugar in water. Evaporation removes most of the water until the solution is of molasses consistency, half sugar and half water. For use as cattle feed, the sugar solution usually needs to be neutralized to dispose of the acid.

In this plant, it is proposed to produce partially hydrolyzed products in the digester, which will give a lower yield of sugar but leave a residue that can be made into hardboard and similar materials. This promises a fuller use of the wood wastes, and a greater income. Southern hardwoods are to be used in the process.

Science News Letter, February 19, 1949

GENERAL SCIENCE

New Child Care Book Will Aid 30,000,000 Parents

► HELP for some 30,000,000 American parents worried about Junior's marks at school, Sister's fibbing and other similar problems of school age is now available in a new booklet published by the U. S. Children's Bureau in Washington.

Called YOUR CHILD FROM SIX TO TWELVE, it becomes a companion to the Children's Bureau's well known and best-selling INFANT CARE.

Although there are now nearly 16,000,000 children between the ages of six and 12 in the Nation, very little has been written for their parents on their care, Children's Bureau authorities found. So they gathered information on the best practices approved by pediatricians, psychiatrists, educators and other specialists and put it into this book.

"The booklet has no magic formula for the care of children," says Katharine F. Lenroot, chief of the Children's Bureau. "But it does explain why children between 6 and 12 behave the way they do. Why they want to do some things and not others. What their physical and mental limitations are. How their abilities can be best developed as they grow older. Above all, the booklet shows how children at this age need and respond to real understanding and respect."

Single copies of YOUR CHILD FROM SIX TO TWELVE are available to parents without charge from the Children's Bureau, Federal Security Agency, Washington 25, D. C.

Science News Letter, February 19, 1949

AGRICULTURE

American Hybrid Corn May Aid Europe's Food Problem

► HYBRID corn from America bids fair to solve a considerable part of Italy's food problem, states Dr. Robert M. Salter of the U. S. Department of Agriculture. Plantings made during the past two seasons in the Po valley, Italy's corn belt, have in some instances boosted the per-acre yield as much as 50%, instead of the 20% to 25% increase obtained in this country. Even a consistent gain of 20% would be a tremendous thing for Europe.

In climate and soil conditions, the Po valley most nearly resembles central Indiana, near the southeastern edge of what is usually considered the great American corn belt. Corn is a mainstay in the diet of the inhabitants of that part of Italy; they eat polenta (cornmeal mush) in preference to the macaroni and spaghetti favored in other parts of the peninsula.

Europe's other great corn-raising area is in the Danube valley, notably in Hungary, Rumania and parts of Yugoslavia. Here conditions resemble those of Iowa and northern Illinois, the heart of the American corn belt. Livestock raising is an important industry in these countries, so that a big boost in the per-acre corn yield, made possible by planting hybrid varieties, would mean much in their national economies.

Corn came early to the Danubian lands. Within 50 years after the discovery of America, it was being grown in the region, under the curious misnomer, "the Turkish grain".

Science News Letter, February 19, 1949

INVENTION

Man-Carried Helicopter Carries Man When Flying

► A HELICOPTER which is designed to be strapped on the back of a man and take him on flights in the air has been awarded a patent by the United States government. This aircraft's engine, on a frame, is fastened to the body much as a parachute is attached. The lifting propellers are over his head.

Patent 2,461,347 was granted to Horace T. Pentecost, Renton, Wash., for this device. It is light enough to be easily carried on the shoulders when walking, but it is claimed to be powerful enough to carry him soaring through the sky.

This small helicopter is of the coaxial counter-rotary type. Its engine is an internal combustion, two-stroke, two-cylinder, opposed-piston affair. It is air-cooled. Starting is by means of a rope around its flywheel, as with the familiar outboard motor type. The engine is stopped by a push button. Control of the aircraft in flight is by a "stick" in front of the user's face, which is connected overhead to the mechanism.

Science News Letter, February 19, 1949

ASTRONOMY

Saturn Shines in Southeast

Jupiter, more brilliant than Saturn, is the only other planet now visible but it rises much later at night. Orion is among the most prominent star groups visible.

By JAMES STOKLEY

▶ **THOUGH** only one planet appears in the evening skies during March, that one—Saturn—is visible through most of the night. As the sun sets and darkness falls, it is already well above the eastern horizon. As shown on the accompanying maps (which depict the heavens at 10:00 p.m. March 1; an hour earlier on the 15th and two hours earlier at the end of the month) Saturn is in the constellation of Leo, the lion. It stands just alongside the star Regulus, but is about 2.3 times as brilliant.

Leo, which Saturn now makes particularly conspicuous, is itself a prominent constellation, with a sub-group called the sickle, of which Regulus marks the end of the handle. The star Denebola, farther to the east, is in the lion's tail.

Though the evenings now find them lower in the west than they were a few months ago, Orion and his neighbors continue to be the most prominent star groups visible. Orion, the warrior, is in the southwest and can be recognized because of the three stars in a row which form his belt. Below this is Rigel and above is Betelgeuse, both of the first magnitude.

Prominent Star Groups

Lower than Orion, and to the left, we find Canis Major, the great dog, with brilliant Sirius. Higher is Canis minor, the lesser dog, in which Procyon shines. And still higher are the twins, Gemini, with Castor and Pollux, the latter of the first magnitude, the former of the second. To the right of Orion, Taurus, the bull, may be observed, with first magnitude Aldebaran. Higher than Taurus is Auriga, the charioteer, with Capella.

Looking toward the east we find three more stars bright enough to be classified under the first magnitude. One is Regulus, near Saturn. Below Leo is Virgo, the maiden, a group containing Spica. Though this also is of magnitude one, it looks much fainter in the position indicated. Its light has to shine through so great a thickness of the earth's atmosphere that it is appreciably dimmed. Later in the night (or in the evening later in the year) we will see it shining higher and of full brilliance. To the left of Virgo (shown on the map of the northern half of the sky) we find Bootes, the bear driver, with brilliant Arcturus.

Swinging high into the north, the great dipper, part of Ursa Major, the great bear, now comes into a conspicuous position. The

pointers are shown, the two stars which show the direction of Polaris, the pole star, which is part of Ursa Minor, the lesser bear. Winding between the two bears is Draco, the dragon.

Still more brilliant than Saturn, is Jupiter, the only other planet now visible, but it rises much later at night. In the constellation of Capricornus, the sea-goat, it appears in the southeast a few hours before the sun. On March 17 Mars is directly beyond the sun, and hence not visible during the month. Similarly Venus and Mercury are also too nearly in the sun's direction to be visible.

With Saturn now so prominent, it is somewhat unfortunate that a telescope is needed to see its most conspicuous feature. This is the system of rings attending the planet. These are thin and flat, standing directly over the Saturnian equator, the inner edge 6,000 miles above the surface. The width of the system is about 41,500 miles, and the outside diameter of the outer ring is 171,000 miles, so they are well over twice the diameter of the planet itself, which is 75,060 miles.

Saturn takes about 29.5 years to make one revolution about the sun. As the ring system always remains parallel to its previous position, twice in the Saturnian "year" the earth is in line with the plane of the rings. Halfway between, they are spread out to the fullest. In February, 1937, they were last seen edgewise, and it was in December, 1943, that they last appeared with the widest opening. Since then they have been closing, but with a telescope they can still be easily seen. In another year or so, they will be on edge again, and when the earth is exactly in their plane they disap-

pear, even through large telescopes. This shows that they are very thin, less than 100 miles and perhaps as little as 10 miles in thickness. If a model of the rings were made with a scale of 10,000 miles to the inch, they would be 17 inches in diameter, and even the thinnest tissue paper would be too thick in proportion.

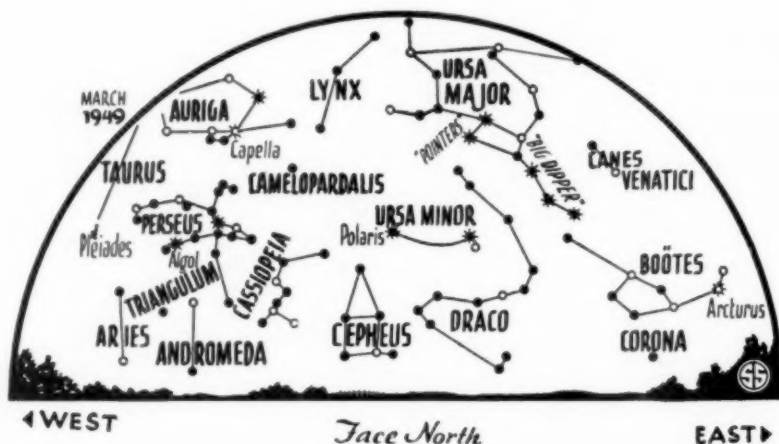
Obviously, they cannot be solid, for no such structure could hold together with these dimensions. They are not liquid, either, but have been shown to consist of a vast swarm of tiny moonlets, of which the smallest may not be larger than grains of sand. The system is divided into several sections, and usually astronomers speak of three main rings. Sometimes a star passes behind them, and though its light is dimmed, it is not completely hidden.

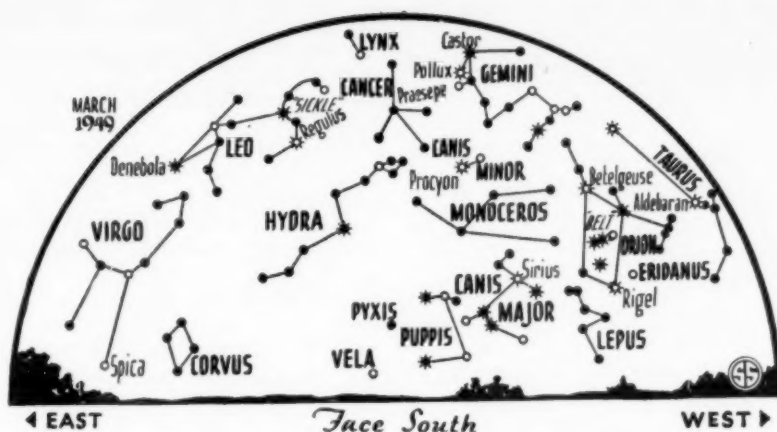
Probably the rings originated untold ages ago, when a previous moon of Saturn was drawn to close to the planet and was smashed to fragments by the forces of gravitation. There is, indeed, a theory that in the distant future our own moon will similarly approach too near the earth, and then the rings of Saturn will lose their uniqueness.

Time Table for March

March	EST	
1	7:00 a. m.	Moon farthest, distance 252,500 miles
7	7:42 p. m.	Moon in first quarter
13	12:54 a. m.	Moon passes Saturn
14	2:03 p. m.	Full moon
	4:00 p. m.	Moon nearest, distance 221,700 miles
17	6:00 a. m.	Mars behind sun
20	5:49 p. m.	Sun crosses equator, spring begins in northern hemisphere
21	8:10 a. m.	Moon in last quarter
23	8:54 a. m.	Moon passes Jupiter
28	8:00 a. m.	Moon farthest, distance 252,600 miles
29	10:11 a. m.	New moon
		Subtract one hour for CT, two hours for MT, and three for PT.

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◊ * ◦ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

GENERAL SCIENCE

Scientists on U. S. Jobs

► LESS red tape and better administration and management—not more money—are needed to attract more scientists to government service. This is the finding of an informal survey of scientists made by Dr. Eric A. Walker of the Ordnance Research Laboratory of Pennsylvania State College.

He wanted to find out why some scientists seem to feel there is an "inherent stigma" to government service.

Comparing the pay of scientists in the government, industry and colleges, Dr. Walker found that a few scientists in top industry jobs get higher salaries than any government scientists. Government scientists, however, tended to get more money than those in the schools.

He concluded that "salary alone is not the reason that scientists are reluctant to enter government service."

On the other hand, Dr. Walker charges that the "administration and management of some of the civil service laboratories is not all it should be."

Red tape came in for some attack from scientists he talked to. An example was the government scientist who said if he needed a tube not available in his stockroom, it took two days to get it from a supply house only 10 miles away.

Another complaint was the division of authority and responsibility in military laboratories. Under this system, a uniformed officer has the authority, but the responsibility lies with a scientist.

"The system appears to be predicated on the assumption that the scientist, being a queer sort of individual, cannot be trusted with such authority," comments Dr. Walker in his report to the AMERICAN JOURNAL OF PHYSICS (Jan.).

A system where scientists may have authority over uniformed officers has been successfully used in other countries, says Dr. Walker. "There is no reason why it should not be adopted by our Armed Ser-

ices," he declares, adding, "if it were adopted more scientists would be less reluctant to accept government service."

Dr. Walker's investigation found few scientists who objected to security regulations. "However, many have objected to the method in which security matters are enforced."

Charges made against Dr. Edward U. Condon, director of the National Bureau of Standards, did not help the government find scientists, Dr. Walker points out.

"Such things as the recent Condon inquiry can only make scientists reluctant to accept Government service. Up to the present time no disloyal act has been proved against Condon, and most scientists feel that if they had been in Condon's shoes, they would have done exactly as he did," Dr. Walker asserts.

Higher salaries for government scientists may help solve the government's scientific personnel problems by bringing better management, the scientist concludes. The new P-9 rating with a top salary of \$15,000 per year may attract administrators who can cut through red tape, he suggests.

Science News Letter, February 19, 1949

ENGINEERING

Metals Strengthened by Glass Toughening Process

► STRENGTH and durability are added to metals used in automobile shafts and levers by a process employing principles similar to those used to make safety glass stronger than ordinary window glass, the Engineers' Club in St. Louis, was told by Robert Schilling of General Motors Research Laboratories.

The toughening process includes the controlled use of so-called trapped or residual stresses within the very texture of the metal itself. Many of these modern processes were used, without benefit of scientific explana-

tion, by swordsmiths, blacksmiths and old time mechanics who improved the life of swords, buggy springs or engine parts by cold hammering them after they had been shaped or fashioned.

In toughening glass, the panes are subjected to a blast of cooling air when they are close to the point of solidification, he said. The outer layer therefore solidifies and cools first, while the core is still soft.

When the interior solidifies and cools later, it contracts and tends to compress the cold outer layers. The finished product is then under compressive or squeezing stresses at the vulnerable outer surface, and under a tension in the interior. These trapped stresses increase the load capacity by several hundred per cent.

Brittle metals, such as through-hardening steels, act in a manner similar to the glass. Some types of heat treating, or mechanical processes such as cold hammering, surface rolling, presetting or shot-peening, can make hard, brittle materials, he said, superior to anything else for severe service by protecting the surfaces with trapped compressive stress.

Science News Letter, February 19, 1949

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VETERINARY MEDICINE

Fight Animal Diseases

More meat, milk and other food are among the benefits expected from the FAO fight on rinderpest and other animal plagues.

► FIVE and a half million tons more milk per year for Europe, fewer famines in China, and large quantities of fresh meat from Ethiopia to feed undersupplied populations. These are among the benefits expected for a hungry world from the fight on rinderpest and other animal plagues now being waged by the Food and Agriculture Organization of the United Nations.

The story of this fight from its hush-hush beginning on a remote Canadian island during the war was told by Dr. K. V. L. Kesteven, Australian doctor of veterinary medicine, now adviser on animal diseases to the FAO. Dr. Kesteven spoke as guest of Watson Davis, director of Science Service, on Adventures in Science

radio program under the auspices of Science Service over the Columbia Broadcasting System.

Rinderpest, fortunately unknown in North and South America, kills according to conservative estimates 3,000,000 animals per year in other parts of the world, Dr. Kesteven declared.

Foot and mouth disease, now being fought in Mexico, is considered only a minor disease in countries that have rinderpest, Dr. Kesteven explained. This is because rinderpest kills off such a very large proportion of the animals, sometimes as much as 90%, in an area when an outbreak does occur.

This is one of the things that brings famine to China and other parts of the Far East. When the animals are killed, all cultivation of crops must be done by hand, and hand cultivation cannot produce enough food to keep the populations alive.

During the war, Dr. Kesteven related, it was feared that rinderpest might be used as a biological warfare weapon. For this reason Canada and the United States set up a research laboratory on Grosse Ile in the St. Lawrence River. As a result of the research work done by this team, a new type of vaccine was produced by growing the rinderpest virus in eggs. Rinderpest is such a contagious disease, however, and travels so very fast, that the risk of keeping virus in even an isolated place like Grosse Ile was too great, so at the end of the war this work finished.

It was realized by FAO that this was a possible vaccine for use in the rinderpest countries of the world. A team of scientists was employed in China, first of all with UNRRA and later on by FAO, to assist the Chinese technicians in the production of this vaccine. At the same time FAO helped develop another vaccine which was prepared by growing the virus in rabbits. Tremendous steps were taken in the practical production and use of these vaccines by this team of workers, in cooperation with the Chinese officials.

At the present time all the countries have the necessary strains for the production of a cheap and efficient vaccine, one which gives lifetime immunity and is easy to administer, so that it is possible for any country with enough technicians and the necessary laboratory equipment to carry out an eradication program and be rid of rinderpest.

Ethiopia, in the center of Africa, is another major danger spot for this cattle disease. While it continues to be infected,

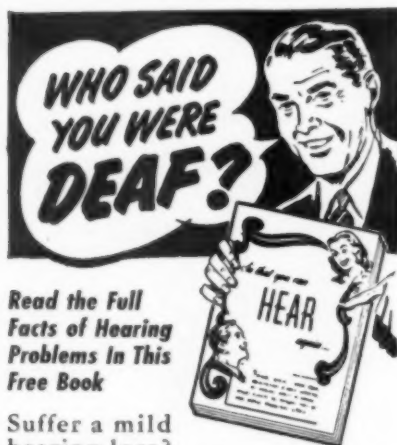
the disease cannot be wiped out of bordering countries and there is always a possibility of its being spread over wide areas. At the present time there are actually too many cattle in Ethiopia, but other countries dare not import Ethiopian meat because of the danger of importing the rinderpest virus along with the meat. FAO experts are at work there now carrying on a vaccination program, but funds for this will be used up by the end of 1949 and the country has no trained technicians of its own to continue the work.

Millions of tons more milk for Europe are expected from new techniques, using penicillin, to control mastitis. Mastitis is a streptococcus infection, often chronic, of the udders of cattle. It reduces immediate production and limits the life of the cow in the herd. Where milk is not pasteurized, control of mastitis would result in a very appreciable reduction in the incidence of certain human infections, such as some types of "strep sore throat."

Recent developments in the control of mastitis are such that it now appears this disease can be reduced to a very low figure. Using new techniques, the cost of this is extremely small when compared with the returns. For instance, the expenditure of a small amount of money in Europe on the production of penicillin in a suitable form, education of the farmers, and the teaching of new techniques to laboratory workers, would increase milk production in Europe by more than 5,000,000 metric tons per year. This would be done without the cost of any additional feedstuff, so short in Europe today.

Science News Letter, February 19, 1949

The frequent high winds of the Great Plains area did little damage when it was only an Indian hunting ground, merely waving the tall grasses on which the buffalo fed; today, they do much damage because of plowing and overgrazing.



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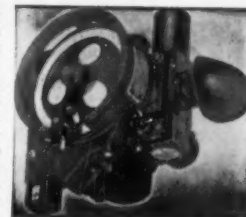
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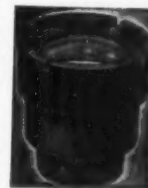
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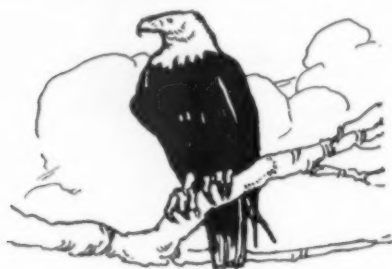


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Disputed Emblem

Washington's birthday is one of the two American national holidays on which the American eagle is supposed to do his proudest screaming. Actually, with the decline in popularity of the "spread-eagle" type of oratory, less is heard about our national emblem than there used to be.

This is, in one respect at least, really too bad. For there are not nearly as many bald eagles in existence now as there were in the early days of the Republic, and over

parts of their range they are being badly harassed despite a law enacted some time ago for their protection. This is especially true in Alaska, where eagles get shot because of their supposed depredations on the salmon runs (which are really relatively trifling) and also to supply plumes to a lively bootleg trade in materials for the Indian war bonnets without which no rodeo or other Wild West pageant can be counted a real success.

Eagles have disappeared from the places where the great early naturalist-artist, Audubon, saw and painted them, simply because the country got settled up and the big trees along the rivers got cut down. For, contrary to a widely held notion, the American or bald eagle did not build its nest for choice on some high cliff in the mountains. Because it feeds mainly on fish it has always preferred tall trees near the waterside. Audubon saw his eagles mostly along the banks of the Ohio and Mississippi rivers, then still largely unsettled. When the forests made way for cities and farms, the best nesting sites vanished, and the eagles vanished with them.

Oddly enough, although Audubon painted some magnificent pictures of the bald

eagle he had a rather low opinion of the bird itself. In this he seconded a still earlier great American, Benjamin Franklin, who denounced the eagle roundly and tried to get the turkey-gobbler adopted as the American national bird instead.

On the whole, however, most Americans are content that the majority sentiment favored the eagle, even though most of the heroic qualities attributed to it are legendary. When in good plumage, the eagle is a magnificent-looking bird, with his dark coat of feathers set off by his pure white head and tail. After all, the main business of an emblem is to look splendid.

We have become a trifle careless, of late, in the depiction of eagles on some of our coins—the George Washington twenty-five cent piece, for example. There the bird is shown with feathered "pants" coming right down to his feet, which is a mark of the golden eagle rather than of the American species. However, on the obverse of the Great Seal of the United States, shown on the dollar bill, the eagle, although shown in the anatomically impossible "displayed" pose, is unmistakably the white-headed, white-tailed American eagle.

Science News Letter, February 19, 1949

ASTRONOMY

No Atmosphere at Birth

► THE EARTH'S atmosphere as we know it today did not exist at the time our planet was created.

The water, nitrogen, oxygen and carbon dioxide that largely make up our atmosphere were formed by chemical processes that took place after the birth of the planet on which we live.

This is the conclusion reached by Dr. Harrison Brown, associate professor of chemistry at the Institute for Nuclear Studies at the University of Chicago. His study of the permanent gases, helium, neon, argon, krypton and xenon indicate that early in its history the earth lost all the gases it may originally have possessed.

The major constituents of the atmosphere during the process of earth formation were locked up chemically in the earth and subsequently released. Thus the earth's atmosphere is almost entirely of secondary origin, he reasons.

"It is perhaps too early to speculate as to the exact nature of the chemical processes involved," Dr. Brown reports, "but it seems reasonable to suppose that the marked differences in the composition of the atmospheres of these three neighboring planets (Venus, Earth, and Mars) may in the future be explained upon the basis of their differences in size, internal composition and temperatures."

The possibility that most terrestrial argon has been produced by the decay of radioactive potassium produces an interesting speculation concerning the atmospheres of

both Mars and Venus, Dr. Brown states in *THE ATMOSPHERES OF THE EARTH AND PLANETS*, University of Chicago Press book just issued, and edited by Dr. Gerard P. Kuiper, director of Yerkes and McDonald Observatories.

If we assume the surface potassium content of both these planets to be similar to that of the earth and neglect escape processes, Dr. Brown says, then both planets should have argon atmospheres similar to that of the earth. Thus argon might well be the chief constituent of Mars' atmosphere.

Science News Letter, February 19, 1949

Words in Science— ISOTOPE

► SOME atoms of the same chemical element may have different weights but otherwise be exactly alike. These chemical "identical twins" are called isotopes, pronounced I-so-top-es with the stress on the "I".

Isotopes have the same number of protons and electrons which are the particles in the atom that carry positive and negative electric charges. The difference in weight is caused by a difference in the number of neutrons, those particles that weigh about the same as a proton but which carry no electric charge.

Science News Letter, February 19, 1949



High on the list of conveniences which the Type E offers to users of sensitive galvanometers is freedom from frequent "spot chasing."

In addition to the large, primary light spot which travels along the 100 mm scale with full galvanometer sensitivity, there is a smaller, brighter secondary spot which moves only one-tenth as far and as fast.

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Further information on request.



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Books of the Week

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ACCLIMATIZATION IN THE ANDES: Historical Confirmations of "Climatic Aggression" in the Development of Andean Man—Carlos Monge—*Johns Hopkins Press*, 130 p., \$2.75. Conclusions drawn from the experimental work of the Institute of Andean Biology plus evidence from old chronicles as to what kind of man can live in the highest permanent habitation in the world. Translated by Donald F. Brown.

ATOMIC ENERGY: Double-Edged Sword of Science—R. Will Burnett—*Charles E. Merrill*, 32 p., illus., paper, 40 cents. Intended as a text unit for social studies classes in secondary school, this small work is a concise presentation for the layman of the development of atomic energy and also its control and possibilities for improving modern living conditions.

CATALOGUE OF BIRDS OF THE AMERICAS AND THE ADJACENT ISLANDS IN FIELD MUSEUM OF NATURAL HISTORY, Part I, Number 3—Charles E. Hellmayr and Boardman Conover—*Field Museum of Natural History*, 383 p., paper, \$4.00.

THE CHEMISTRY OF PENICILLIN—Hans T. Clarke, John R. Johnson, and Sir Robert Robinson—*Princeton University Press*, 1094 p., illus., \$36.00. Detailed report of a unique international study of what the chemical constitution of penicillin is and how it can be synthesized.

CHILD PSYCHIATRY—Leo Kanner—*Thomas*, 2d ed., 752 p., \$8.50. A complete rewriting of the well-known textbook to take advantage of the enormous strides in psychiatry in recent years.

COMMUNISM: ITS PLANS AND TACTICS—Frances P. Bolton, Chester E. Merrow, Donald L. Jackson, Franklin J. Maloney, Wirt Courtney and Thomas E. Morgan—*Infantry Journal*, 102 p., \$2.00. Report of Subcommittee 5 of the Committee on Foreign Affairs of the House of Representatives.

FEAR, WAR, AND THE BOMB: Military and Political Consequences of Atomic Energy—P. M. S. Blackett—*McGraw-Hill*, 244 p., \$3.50. The book by the British Nobelist which caused much comment when it was published in England is now made available to American readers.

HOW PSYCHIATRY HELPS—Phillip Polatin and Ellen C. Philpott—*Harper*, 242 p., \$3.00. Giving clearly and concisely, useful information for mental patients and their relatives about the principal mental illnesses and what modern medicine is doing for them. There is also a chapter on "Ounces of Prevention."

HUMAN BEHAVIOR AND THE PRINCIPLE OF LEAST EFFORT. An Introduction to Human Ecology—George Kingsley Zipf—*Addison-Wesley*, 573 p., \$6.50. Applying the methods of the natural sciences to an attempt to understand human behavior, the author proposes the Principle of Least Effort as the primary principle governing individual and collective behavior, including language and preconceptions that now seem to hinder world accord.

INTRODUCTION TO ATOMIC PHYSICS—Otto Oldenberg—*McGraw-Hill*, 373 p., illus., \$5.00. A textbook for students who have already had some physics and chemistry. The outgrowth of a course given by the author at Harvard.

INTRODUCTION TO HISTORICAL GEOLOGY—Raymond Cecil Moore—*McGraw-Hill*, 582 p., illus., \$5.00. For students of historical geology and also for those curious about the world they live in.

KINETICS OF CHEMICAL CHANGE IN SOLUTION—Edward S. Amis—*Macmillan*, 332 p., \$5.00. A text for students of kinetics.

THE MAYA CHONTAL INDIANS OF ACALAN-TIXCHEL: A Contribution to the History and Ethnography of the Yucatan Peninsula—France V. Scholes and Ralph L. Roys—*Carnegie Institution of Washington*, 565 p., illus., \$3.50 paper, \$4.75 cloth. Based in large part on a unique text in the Chontal language spoken at the time of the Conquest by Indians of Tobasco and Acalan.

NUMERICAL CALCULUS: Approximations, Interpolation, Finite Differences, Numerical Integration, and Curve Fitting—William Edmund Milne—*Princeton University Press*, 393 p., \$3.75. Intended to bridge the usual gap between classroom mathematics and numerical applications.

THE PARASITIC CUCKOOS OF AFRICA—Herbert Friedmann—*Washington Academy of Sciences*, 204 p., illus., \$4.50. The Curator of Birds of the U. S. National Museum writes a most interesting account of the bird that leaves its eggs orphans in other birds' nests for hatching.

REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION AND FINANCIAL REPORT OF THE EXECUTIVE COMMITTEE OF THE BOARD OF REGENTS FOR THE YEAR ENDED JUNE 30, 1948—*Government Printing Office*, 158 p., illus., paper, 55 cents.

DRUG PLANTS OF AFRICA—Thomas S. Githens—*University of Pennsylvania Press*, 125 p., paper, \$2.25. A scientific evaluation of the use by the inhabitants of Africa of their native plants to cure ills, or to poison.

SEARCHLIGHTS ON DELINQUENCY: New Psychoanalytic Studies—K. R. Eissler, Ed.—*International Universities Press*, 456 p., \$10.00. Scientists in several countries have contributed to this volume as an honor to August Aichhorn, author of "Wayward Youth," on his 70th birthday.

SEDIMENTARY ROCKS—F. J. Pettijohn—*Harper*, 526 p., illus., \$7.50. A beautifully illustrated book for either the student of geology or the enthusiast about rocks.

VEGETABLE GROWING—James Edward Knott—*Lea & Febiger*, 4th ed., 314 p., illus., \$4.00. A textbook for agriculture students which would also be useful to the home or market gardener.

WAVEFORMS—Britton Chance, Vernon Hughes, Edward F. MacNichol, David Sayre and Frederick C. Williams, Eds.—*McGraw-Hill*, 785 p., illus., \$10.00. Includes much material not yet published in journals or reports.

Science News Letter, February 19, 1949

Science Service Radio

► LISTEN in to a discussion on "Fish for the Future" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST, Saturday, Feb. 26. Dr. Wilbert M. Chapman, special assistant to the Undersecretary of State for fisheries and wildlife, and Minister Thor Thors, minister to the United States from Iceland and chairman of the Icelandic Delegation to the International Fisheries Conference will be guests of Watson Davis, director of Science Service. Experts have been meeting for the past several months in Washington to consider the future supply of fish particularly in the North Atlantic. The two guests will discuss authoritatively the many scientific and practical questions that have arisen in this attempt to preserve resources from the sea.

Science News Letter, February 19, 1949

Television programs on large screens in motion picture theaters are projected either from the television receiver by a highly reflective optical system or from films made by photographing the pictures on the television screen.

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• New Machines and Gadgets •

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❁ **TEMPERATURE** regulator for the house is an instrument attached outside the building and wired into the regular room thermostat as any other clock switch would be wired. It is a weather-actuated control of night setback of building temperatures that anticipates the need for heat and automatically starts heating earlier the colder it is outdoors.

Science News Letter, February 19, 1949

❁ **OFFSET PRINTING** directly from pasted-up layouts eliminates costly negatives and photographic plates. The big difference between the new process and the old method is that the pasteup goes right on the press. Proofing, as well as camera equipment and other usual offset necessities, are cut out.

Science News Letter, February 19, 1949

❁ **SANDPAPER HOLDER**, for use in all types of hand sanding, is a plastic block which holds a roll of paper, and has a wire clasp to release a new length of paper when one becomes worn out. It is available in seven-inch and five-inch sizes with refill rolls of sandpaper.

Science News Letter, February 19, 1949

❁ **TRANSMITTING TUBE**, a 25,000-watt type used to bring radio programs from station to home, has had its weight reduced 56% by the substitution of aluminum for



copper made possible by an aluminum-to-steel bonding process. The radiator fins that disperse the heat of the tube are shown in the picture.

Science News Letter, February 19, 1949

❁ **DRINKING CUP** for the youngster is silver-plated on copper and has a flared lip around the entire rim so that at what-

ever point the child drinks, his lip is fitted to the cup in a natural position that ends spilling and mess. The graceful cup may be used as a cigarette holder when no longer needed by the child.

Science News Letter, February 19, 1949

❁ **SNOW SLED**, with either skis or wheels on the front and caterpillar traction on the rear, is an engine-driven over-snow vehicle that slides on the snow and also depends on the weight of the vehicle for traction. An open link grouser track moves around the outside of its rear pontoon runners, and the broad pontoon shoes slide on the snow.

Science News Letter, February 19, 1949

❁ **WIRE STRIPPER**, to remove insulation from wires of ordinary sizes, is a tubular handle with an end piece which has a V-shaped slot in its center. Its cutting edges grasp and remove the insulation without damage to the wire.

Science News Letter, February 19, 1949

❁ **SPORTS CAP**, with a rigid green plastic visor to admit light and keep out glare, has a zipper pocket on the front of the crown to hold various small items when a coat is not worn. On top of the visor, when desired, are welded loops for golf tees or fish flies.

Science News Letter, February 19, 1949

The federal government is considering a plan to raise the level of Eklutna Lake, near Anchorage, Alaska, about two feet by a low dam, and use the water to develop electrical energy for military and industrial purposes.

Science News Letter, February 19, 1949

Do You Know?

Some sunflower seed yields 30% of its weight in edible oil.

Blind pedestrians have the legal right of way over motorists in 16 American states.

Wormwood is the source of an oil used externally to warm muscles.

America imports tea wastes from China for the manufacture of caffeine.

Popular gold jewelry is usually about 14 karat, while pure gold is 24 karats.

Electric eels have an attack power up to 600 volts.

Texas, Louisiana, California and Oklahoma rank in that order in the production of natural gas.

There are some 20,000,000 acres of land in America that would profit from irrigation.

India is to have a new aluminum production factory; the country is said to have a plentiful supply of suitable domestic bauxite.

To encourage peanut cultivation in the Dominican Republic, agricultural machinery is being made available by the government to farmers at a nominal charge.

Jewelry stamped with the abbreviations Plat, Pall, Irid, Rhod or Ruth contain respectively platinum, palladium, iridium, rhodium or ruthenium.

Lady finger potato, still grown as a curiosity in the United States but of practically no commercial value, is about the size of a short, stubby finger of a man.

A man-made shipping channel 50 miles long, connecting Houston, Texas, with the Gulf of Mexico, is responsible for that city being perhaps the third ranking deep-sea port in the United States.

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